

Appl. No : 10/055,094
Amdt. dated : 09/30/03
Reply to Office Action of 07/23/03

Amendments to the Specification:

1) page 6, third paragraph, please replace this text with the following amended text:

Figs. [6a through 6c] 6b and 6c show examples of the method of the invention of anchoring a heat spreader over the surface of a substrate, the substrates of the two representations are different.

2) page 6, last paragraph, please replace this text with the following amended text:

Figs. 8a through 8f show a second flow of creating a PBGA package using the anchoring method of the invention, this [first] second method incorporates enhancing the conventional heat spreader attach tool.

3) page 13, second paragraph, please replace this text with the following amended text:

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The contact points 29, also referred to as anchor posts, can be created using epoxy to which traces of silver have been added or solder paste or a solid metal.

4) page 13, last paragraph, page 14, first paragraph, please replace this text with the following amended text:

Fig. 4 shows a cross section of the section 38, Fig. 1, the heat spreader standoff of the heat spreader 14, which highlights:

- a first surface of the heat spreader 14 is seated directly over a second surface of the substrate 12
- no adhesive glue is provided in the interface between the heat spreader 14 and substrate 12
- the heat spreader stand-off 38, and therewith the heat spreader 14, is seated over the second surface of substrate 12 by means of a positioning and anchoring post 31 that is pre-formed over the surface of substrate 12
- anchoring post 31 is centered with respect to and inserted through an opening 33 that has been provided for this purpose in the heat spreader stand-off 38

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35 highlights the consistent seating height of the heat spreader 14, which is made possible by the direct contact between the heat spreader stand-off post 38 and the substrate 12, without any intervening layers of glue, paste and the like.

5) page 14, second paragraph, please replace this text with the following amended text:

Fig. 5 shows a cross section ~~[[this]]~~ that is identical to the cross section of Fig. 4 with exception of the addition of an optional layer 37 of electrically and/or thermally conductive material. This optional layer 37 provides for firmer seating and locking of the standoff 38~~[[, in]]~~. In addition, layer 37 enhances thermal conduction from the heat spreader 14 to [the surface of] substrate 12.

6) page 17, second paragraph, please replace this text with the following amended text:

Figs. 7a through 7g and 8a through 8f are provided to show

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the heat spreader attach processing steps of the invention before the molding is applied, these two sets of figures are differentiated as follows:

- Figs. 7a through 7g show the indicated flow, implemented by enhancing the die attach machine, and
- Figs. 8a through 8f show the indicated flow, implemented by enhancing the conventional die heat spreader attach machine.